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NORTH DAKOTA UNIV GRAND FORKS

TESTING AND EVALUATION OF ARCHEOLOGICAL SITES 32ML404 AND 32ML4--ETC(U)

SEP 78 D E GRIFFIN; S A AHLER

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Testing and Evaluation of Archeological Sites
32ML404 and 32ML406 in McLean County, North Dakota,

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by

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David E. /Griffin, Jr.

and

Stanley A. /Ahler

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University of North Dakota

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In fulfillment of Purchase Order Contract No. DACW45-78-M-2633, an
archeological project conducted under cooperative agreement between the
U. S. Army Corps of Engineers, Omaha District, and the University of
North Dakota, Grand Forks.

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Abstract

Archeological investigations were performed at two archeological sites, 32ML404 and 32ML406, on the left bank of the Missouri River in McLean County, North Dakota, in areas planned for river bank stabilization under the auspices of the U.S. Army Corps of Engineers. The goal of the investigations was to determine the content, extent, and significance of the sites and to provide recommendations for necessary mitigative actions. Proton magnetometer survey, soil coring, and hand excavation yielded little new information about either site that was not available from observations in the riverbank exposure at each location. Even so, it is thought likely that each site represents some aspect of Plains Village Tradition flood plain horticultural practices or winter village related activity, and as such, each site is likely to contain new and significant data on the regional prehistory. Based on this likelihood, both sites are judged to qualify for nomination to the National Register of Historic Places, and recommendations for protection during and after stabilization construction are offered for each location.

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Introduction

In May of 1977 a cultural resource reconnaissance was conducted in eight proposed bank stabilization areas along the Missouri River in central North Dakota (Zimmerman et al. 1977). Cultural remains were encountered in two separate locations, in the Sandstone Bluff II area, and in the Painted Woods area; both of these areas are on the left bank of the Missouri River in McLean County. Each location has subsequently been designated as an archeological site: 32ML404 (Tick City site), and 32ML406 (Ivyland site) (see Figure 1). Each site was represented by a subsurface charcoal bearing stratum exposed in the eroding riverbank, and each site was recommended for subsequent work to evaluate the extent and importance of the cultural materials contained therein.

The report that follows documents the results of fieldwork and other investigations at the sites performed during June, July, and August of 1978 under purchase order contract by the University of North Dakota for the Omaha District of the U.S. Army Corps of Engineers. The purpose of these investigations was to provide the Corps with information of the physical limits or extent of each site and the cultural content and significance of each site; providing this information will allow meaningful recommendations concerning possible mitigative actions required in conjunction with the planned bank stabilization in each site area. For reference, the Scope of Work for the project is reproduced in Appendix A and the proposal for investigations offered by the University of North Dakota is reproduced in Appendix B.

This project was conducted under the overall supervision of Stanley A. Ahler, the Principal Investigator. Fieldwork was conducted on an intermittent basis by various personnel involved in the University of North Dakota-National Park Service archeological investigations in the Knife River Indian Villages National Historic Site near Stanton, North Dakota. This Fieldwork was accomplished during all or parts of 14 days in the months of June and July 1978. Fieldwork, laboratory analysis, and preparation of the initial draft of the project report were conducted by David E. Griffin, the Project Supervisor. Connie Bennett and Ellen Dubas of the Midwest Archeological Center provided expertise in conducting the proton magnetometer survey and analysis of the magnetic data. Magnetic survey equipment was made available by the Midwest Archeological Center of the National Park Service. Carl R. Falk provided the identification and analysis of faunal remains appearing in this report. Other participants in the fieldwork included the following persons, listed in order of decreasing involvement in the project: Joan Richtsmeier, Jerry Holzer, Sonny Trimble, Tom Connolly, Lisa Carlson, Dean Mehrer, and Jim Batura.

Regional Setting

The two sites are located on the flood plain of the Missouri River in areas of recently deposited alluvium. The present day course of the Missouri River was formed as a result of one of the Pleistocene glacial advances blocking the east flowing drainages and forcing the flow of

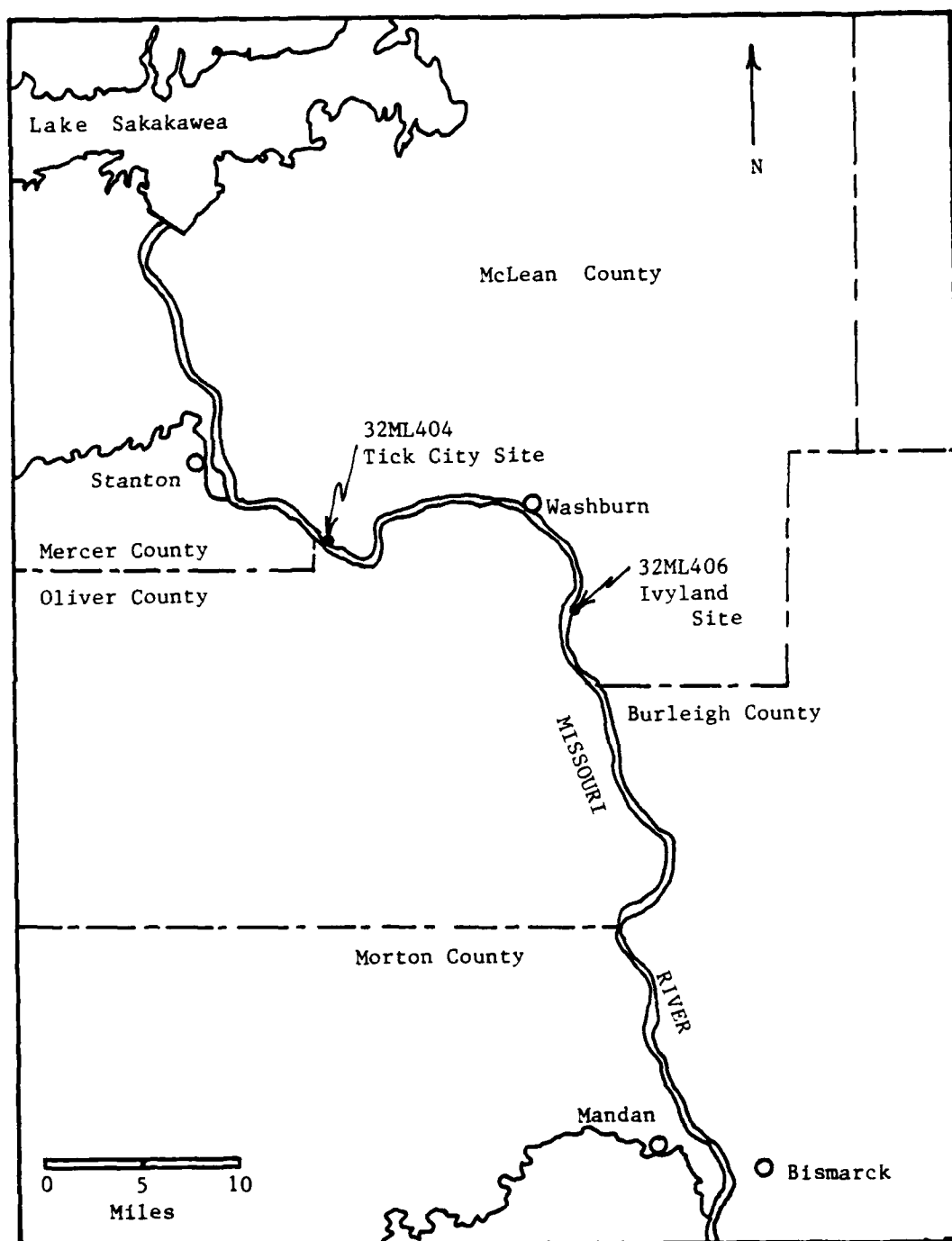


Figure 1. Map of a portion of central North Dakota showing general locations of archeological sites 32ML404 and 32ML406.

ivers to the south. Rivers that once had their mouths at the Hudson Bay were changed so that their drainage systems moved into the Mississippi River drainage. Since that time the river has become deeply entrenched, and through the processes of degradation and aggradation, the river has meandered and created a valley up to several miles in width with two or more terraces on either side (see Lehmer 1971:49-53). The terraces, which are generally discontinuous, and the flood plain, including islands, sandbars, and the channel, constitute the two major physiographic units within the Missouri River trench (Lehmer 1971:50-51).

The climate of the region is one of extremes. Summers produce days that are hot (frequently greater than 100° F), dry, and windy. Winters can be characterized as very harsh; weeks of subzero weather accompanied by wind are not uncommon. The average temperature for the area is between 36° and 44° F with minimum and maximum temperatures recorded at Bismarck, North Dakota, as being -45° F and 114° F, respectively (Zimmerman *et al.* 1977:3). The average number of frost-free days recorded at Washburn, North Dakota, is roughly 133 (Lehmer 1971:54). Both climate and temperature are thought to have been important contributing factors to the existence of horticultural peoples in the valley. The annual precipitation is approximately 15 inches per annum, but extremes ranging from roughly 10 inches to 24 inches have been recorded in the region (Lehmer 1971:54).

A wide variety of flora and fauna have existed throughout the northern plains. The Missouri Plateau, which surrounds the Missouri River trench, can be characterized as short-grass plains with bunch grass species that have extensive root systems. These grasses are highly adapted to the extremes of the climate and grow rapidly when conditions warrant and remain dormant under adverse conditions. Cutting through the grassland is the Missouri River trench which is dominated by timber. The major dominants include cottonwood, willow, American elm, ash, box elder, and some bur oak on the higher and drier terraces.

The fauna in the region include aggregating (herd) animals as well as those that are dispersed. The most important animal to prehistoric inhabitants of the area was the bison which is a herd animal and served as a primary faunal resource. Important fauna that do not aggregate include deer, elk, antelope and dog. Other fauna in the area include rabbit, squirrel, prairie dog, badger, beaver, bobcat, coyote, fox, porcupine, skunk, vole, and wolf (Zimmerman *et al.* 1977:4; Lehmer 1971:55). Varieties of avifauna are present and include the bittern, crow, eagle, goose, grouse, grackle, hawk, heron, magpie, owl, passenger pigeon, prairie chicken, raven, whistling swan, and whooping crane (Lehmer 1971:55).

Site Descriptions

The Tick City site (32ML404) ([REDACTED] , [REDACTED]) is in the left (north) bank of the Missouri River about 12.5 river miles upstream from the town of Washburn. The most distinctive feature of the site is an apparent hearth; it consists of a lens of mixed charcoal, ash, and burned earth, that measures 20 cm in thickness and ca. 60 cm

in length, and is exposed in a charcoal bearing stratum ca. 1.0 m below the present ground surface and ca. 5 m above the current river level. The charcoal bearing level, being composed of slightly darker sediments, can be traced for more than 100 m upstream and downstream from the hearth. When the site was first visited by Ahler in 1977, a large pit-like feature was observed in the cutbank about 6 m upstream from the hearth. This feature was filled with sandy sediments and large pieces of charcoal and at least one fragment of bone. The base of this pit-like feature is some 2.5 m below surface, but the point of origin of this feature was difficult to determine. Another possible pit containing charcoal and dark sediments was also observed in 1977, located ca. 75 m upstream from the hearth, but this pit was not relocated during the 1978 fieldwork. The landowner, Joe Thompson, indicated that the hearth area exposed was one of several "bonfires" in the general site area that had been exposed and had been eroded away by bank cutting during the past decade. Thompson stated that several earlier hearths were several meters in extent and that some contained remains of bison and elk as well as glass trade beads. It was largely on the basis of Thompson's observations, rather than the meager evidence observable in 1977 and 1978, that this location was designated as an archeological site.

The Ivyland site (32ML406) ([REDACTED]) is in the left (east) bank of the Missouri River about 4.5 river miles downstream from the town of Washburn and approximately 100 m downstream from the mouth of Nettle Creek, which drains Painted Woods Lake. The site is distinguished by a layer of bone and charcoal about 4 cm thick and 7 m in extent, eroding from the exposed cutbank (Zimmerman et al. 1977:11), and the cultural exposure appeared little changed when observed during the 1978 fieldwork.

Methods and Results of Investigations

A three-phase program of field investigation was planned (Appendix B) and executed; this program included: (1) survey with proton magnetometer, designed to determine the presence and extent of certain buried cultural features; (2) hand soil coring to confirm magnetic results and help determine the site limits, and (3) hand excavation of a small number of test units to determine the nature and content of buried cultural deposits. Each phase of the fieldwork is discussed in the following paragraphs.

Magnetic Survey

Magnetic survey using a proton magnetometer is a nondestructive technique which, in some cases, has proven to be useful for locating subsurface features without excavation. In addition, large areas of land can be surveyed in a relatively small period of time allowing for more detailed pattern and density configurations than could be obtained through more traditional techniques.

The proton magnetometer reacts to subsurface changes in the earth's magnetic field and is read in gamma values. Iron or materials that have been burned or fired, such as fire hearths and bricks, are most easily detected, but disturbances beneath the surface, such as trash-filled pits and edges of house pit depressions, may also be detected

(see Aitken 1974 and Tite 1974 for a background of the theory of magnetometry and Weymouth 1976 and Weymouth and Nickel 1977 for practical applications of magnetic survey in the norther plains).

In order to explore, detect, and map changes in the earth's magnetic field, two magnetometers, one stationary and one mobile, were utilized. Each magnetometer has a sensitivity of one gamma. While the stationary magnetometer is placed in a "magnetically quiet" area, the mobile magnetometer is moved along a series of grid points at known intervals (generally 1 to 2 m depending upon the site area to be examined). At each grid point the difference between the stationary and mobile magnetometers is calculated, and the difference is either hand recorded or entered into a computer for mapping.

At both the Tick City and Ivyland sites a total area of 1200 square meters was magnetically surveyed. At each site the survey covered all or parts of four 20m by 20 m survey blocks, labelled A through D from downstream to upstream. This yielded magnetic data in an area extending 80 m along the cutbank exposure and from 10 to 20 m perpendicular to the river bank (Figures 2 and 3). In each case, the survey area was approximately centered over the previously observed cultural deposits exposed in the riverbank. Magnetic data were read and recorded over the survey areas at spatial intervals of 1 m. The data, once recorded on data sheets, were entered into a Polymorphic Systems 88 computer in the field and computer maps of magnetic values were generated (see Figures 2 and 3).

The results of the magnetic survey yielded no high positive or high negative values that display any discernible patterning clearly interpretable as subsurface cultural features. In both sites there is a general gradation from higher magnetic values near the bank edge to lower values away from the edge. The few isolated high positive anomalies noted throughout the grids probably represent stray pieces of iron that lie close to the present day surface. Those positive anomalies in blocks C and D at Ivyland (Figure 3) most likely relate to an old road bed that runs diagonally toward the mouth of Nettle Creek. In both sites the dark border relates to the bank line that parallels the Missouri River and probably reflects differential drying and cracking of the soil along the bank edge.

Soil Coring

Soil coring was conducted using a hand corer which removed a 2.5 cm diameter soil core. Coring was done at 2 m intervals parallel to the bank edge and to a distance of 6 m back from the bankline in block A, B, and part of C at each site. The area cored encompassed the strata of charcoal exposed in the bankline at both sites. All cores were to a maximum depth of 150 cm.

At Tick City the basic pattern of strata was one of alternating bands of silty-sand and clay with bits of charcoal occurring primarily at depths ranging from 100-120 cm below surface in virtually every core hole. Isolated flecks of charcoal were also noted in some holes as high as 87 cm and as low as 150 cm below surface. No cultural material was noted in any of the cores.

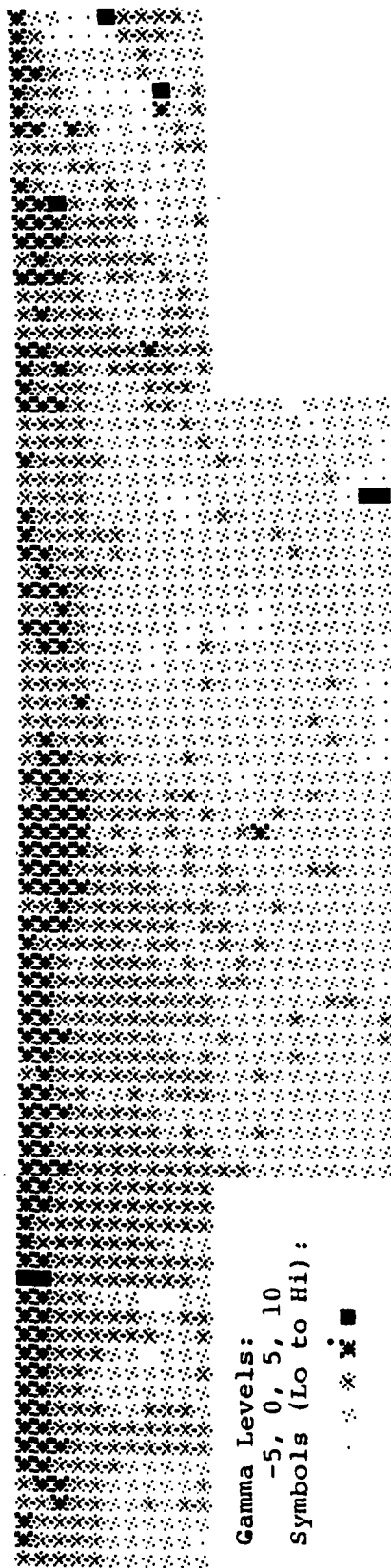
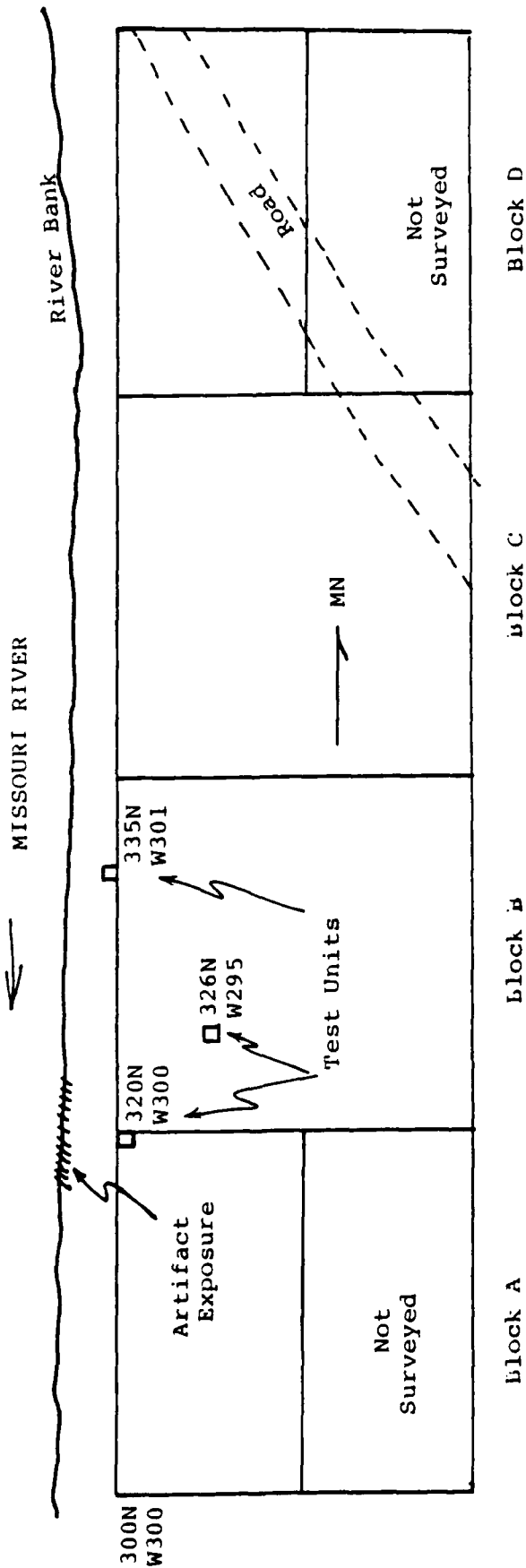


Figure 3. Plan map of magnetic survey grid and test excavation units at the Ivyland site, 32ML406. Each survey block is 20 m by 20 m square. Computer produced magnetic gamma value map at bottom, showing differences between moving and stationary magnetometer readings.

At Ivyland no cultural material or charcoal was noted in any of the core holes. The basic pattern of strata was one of alternating bands of sand and clay. A sand dune occurs in the southern end of the site (in block A and part of block B), parallel to the bank; it is about 1 m to 1.5 m in height and is probably the result of wind deposition from the river edge.

The results of both the magnetic survey and soil coring were inconclusive in determining the extent, physical limits, or contents of the sites observable in the bank profiles. The magnetometer revealed no interpretable subsurface anomalies, while the soil coring revealed charcoal at a relatively uniform depth throughout the area at Tick City and nothing interpretable as archeological at Ivyland. Thus, in these particular instances, the results of these techniques were not particularly useful for planning the location of test excavation units.

Test Excavations

A total of three 1 m by 1 m test units were hand excavated at each site (Figure 2 and 3). One unit at each site was designed to examine the cultural material exposed in the bank profile and was located adjacent to the material exposed in the riverbank. In each of these units the overburden above the presumed cultural zone was removed without screening. The remaining two excavation units at each site were designed to explore the lateral extent of materials exposed in the bank profile. Each of these units was excavated in 15 cm levels from the surface to completion. In each unit a 20 cm by 20 cm column was processed by waterscreening over 16 per inch mesh hardware cloth to recover small-scale remains, and the remaining excavated matrix was dry screened over 4 per inch mesh hardware cloth.

Excavation squares at the Tick City site were dug to a depth of 115 cm below the surface. In all units the natural stratigraphy was essentially the same as that exposed in the riverbank; it consisted of approximately a half dozen bands of fine overbank alluvial sand that differed only in color and clay content. No artifacts or cultural material other than charcoal were recovered from any excavation unit. In all units the charcoal was located at depths greater than 90 cm below surface; it originated in a slightly darker, more clayey sand zone that corresponded stratigraphically to the zone containing the hearth exposed in the riverbank.

An intensive reexamination of the riverbank exposure at Tick City revealed a single, isolated glass trade bead, blue in color and barrel-shaped, located 1 m below the surface in the charcoal-bearing stratum 83.3 m east of the hearth location. In addition, a charred seed, possibly grape (*Vitus* sp.), and a fragment of burned nutshell were found in a displaced slumpblock just east of the hearth area.

The three test excavation units at the Ivyland site varied from 105 to 135 cm below surface. Similar stratigraphy was revealed in each unit; it consisted of alternating banks of more or less sandy overbank alluvium similar to that exposed in the eroding riverbank. None of the test excavation units at Ivyland produced any cultural materials of any kind.

In a final attempt to provide some basis for evaluation of the Ivyland site, bone and other cultural materials were removed from the cultural stratum exposed in the cutbank at a point approximately 4 m south of grid point 320NW300 (Figure 3). Artifacts removed include a single, unpatinated flake of Knife River Flint and a single, grit tempered body sherd lacking any discernable surface treatment or modification. The bulk of cultural remains from the cutbank consisted of vertebrate faunal remains, the description of which is provided here by Carl R. Falk.

Seventy-seven pieces of bone and antler were removed from the Ivyland site cutbank exposure. With the exception of antler, all bone remains are in relatively good condition. Most pieces show some evidence of surface erosion, and several show evidence of recent breakage from their removal during excavation. None of the pieces are charred or otherwise burned, nor do they show evidence of rodent/carnivore gnawing or erosion from gastric juices.

Fifteen of the recovered pieces are sufficiently complete to permit their identification with respect to taxon and element. Bison remains constitute the majority of identified pieces (12 specimens) and include cranial, axial, and appendicular elements. Table 1 provides a full summary of these identified remains. A single deer (*Odocoileus* sp.) humerus and elk (wapiti; *Elaphas canadensis*) antler make up the remainder of the identified sample. Macroscopically, none of the antler pieces show evidence of anything other than natural wear.

With a single exception, all unidentified bone scrap appears to represent remains of large mammal -- bison, or perhaps elk. Included within the bone debris are fragments representing long bones, ribs, and vertebral spines. A single fragment of long bone represents a smaller medium-sized mammal, perhaps an Artiodactyl or large canid.

Evaluation of Results

A review of data (Lehmer 1971; Adamczyk 1975; Ahler 1978) on known archeological sites in the part of the Missouri River Valley under investigation reveals little in the way of information which might be useful for comparison and interpretation of the Tick City and Ivyland sites. By far the majority of recorded sites in the area are major earthlodge villages located on higher and older terrace edges overlooking the flood plain, followed in frequency by Woodland mound groups located in the uplands adjacent to the Missouri trench. Data on sites in the flood plain proper are practically nonexistent. One exception is a series of archeological exposures recently documented (Ahler 1976) to be eroding from the flood plain cutbank some thirty miles downstream from the Ivyland site in the Eagles Park bank stabilization area in Burleigh County. In the Eagles Park area buried layers of large mammal bone and combinations of bone refuse and ash and charcoal were recorded in situations very similar to the exposures at Tick City and Ivyland. At Eagles Park the preliminary reconnaissance did not allow accurate determination of the age, cultural content, or origin of the archeological remains discovered.

Table 1. Summary Tabulation of Identified Vertebrate Fauna from Site 32ML406;
McLean County, North Dakota.

Taxonomic Identification	Element	Description	Comment
<u>Elaphas canadensis</u> (elk or wapiti)	frontal with attached antler	right	brow tine and main beam missing
	antler tine	unside	fragmented; probably portion of above specimen
<u>Odocoileus sp.</u> (white-tailed/ black-tailed deer)	humerus	distal, right	several parallel "butchering marks" along medial distal surface
<u>Bison bison</u> (bison)	mandible	right	portion of ascending ramus with coronoid process
	hyoid	complete, right	
	tibia	distal, left	same element represented in bone scrap
	1st phalanx	proximal, left	
	2nd phalanx (2 specimens)	complete, right	manus (?)
	3rd phalanx (3 specimens)	complete, left	2-manus (?), 1-pes (?)

Table 1 Continued

Taxonomic Identification	Element	Description	Comment
<u>Bison bison</u> (bison)	scapula	proximal, unsided	"butchering marks" evident; taxonomic ident. tentative
	lumbar vertebra	transverse processes (2)	taxonomic ident. tentative
	metacarpal/tarsal	distal, unsided	

Historic data (e.g. Thwaites 1904-05; Maximilian 1843) indicate that the aboriginal Plains Village peoples in the area used the flood plain for two major activities which might be relevant to the interpretation of the sites being examined. The flood plain was preferred farmland, used for growing corn, beans, squash and sunflowers, and secondly, the flood plain forests were used as a location for winter villages occupied during the most severe months of the year. Ethnographic data, such as Wilson (1934) and Gilbert Wilson's notes on file at the University of North Dakota, indicate that the winter earthlodges were built on a similar but less substantial plan than the more permanent summer houses, and that winter villages built by the Hidatsa were normally occupied for only one or two winters and then were abandoned in favor of another building site.

The historic and ethnographic data certainly suggest that the most likely explanation for the materials observed at the Tick City and Ivyland sites would be some manifestation of Plains Village winter habitation or flood plain farming activities. Yet, we are hard pressed to fully evaluate either hypothesis using the archeological data in hand. At Tick City, the fieldwork failed to clearly establish the limits of the site or the site structure. While the site seems to be associated with an extensive charcoal-bearing stratum, it remains unclear if the charcoal is cultural in origin, and whether there is any remaining internal structure to the site in addition to the single hearth and possible pit still observable in the cutbank. In fact, lacking Joe Thompson's observations and collections from the site, there would still be considerable question that Tick City is even an archeological manifestation. Thompson's observation of numerous discrete, widely spaced burned areas, associated with animal bone and glass trade beads, is certainly suggestive of a historic period winter village occupation, but the data collected in this investigation add little to this suggestion.

At Ivyland, the butchered animal bone, chipped stone, and ceramic remains confirm the presence of apparent Plains Village cultural activities, but all other investigations have added little data on the extent or function of the site. Given the topographic setting, it is possible and even likely that multiple, spatially discrete concentrations of cultural material may occur at the site, particularly to the north nearer the junction of Nettle Creek and the Missouri River; the current investigations, however, have failed to confirm such a possibility.

In sum, the efforts recorded here have been relatively unsuccessful in determining either the cultural content or absolute extent of cultural remains at either the Tick City or Ivyland sites. It is apparent from magnetic data that additional closely spaced, large scale features, such as large hearths, do not exist in the survey areas at either site. It is apparent from the coring and test excavations that neither site contains a broad continuous layer of dense cultural debris extending back from the original find spots exposed in the cutbank. Evidence from the Tick City site suggests an historic or a post-contact age for the cultural remains, and evidence from the Ivyland site suggests a Plains Village manifestation of unknown time period. The possibility remains open that both sites contain additional substantial cultural remains which are located in spatially discrete concentrations lying

beyond the extremes of the limited areas examined by magnetometer, coring, and test excavations. Only a major excavation effort, using heavy machinery to provide stratigraphic exposures and to remove overburden, would provide the answer to this possibility, and such efforts are clearly beyond the means and requirements of the construction situation at hand.

Summary and Recommendations

The magnetic survey, soil coring, and test excavations have provided little new information concerning either the extent or content of the Tick City and Ivyland archeological sites. At face value, the field results indicate that the two sites are very minor and perhaps no larger in extent than the visible exposure in the eroded riverbank. The necessarily limited scope of the investigations performed here, taken in conjunction with one landowner's observations at Tick City site over a number of years, indicate, however, that it is quite possible that each site contains additional cultural material lying well beyond the specific area of examination, and that these materials may be of some significance to a better understanding to the cultural history of the region. This possibility and the fact we have practically no hard data on winter villages, farming areas, or other activity locations in the Missouri River flood plain, have led the authors to the conclusion that these sites still remain of high potential importance and that some measures should be taken to protect a reasonably extensive part of each site area from unnecessary erosion or alteration during construction activities.

Further, because it is likely that both sites contain additional data significant to the understanding of regional prehistory, it is judged that both sites, 32ML404 and 32ML406, qualify for nomination to the National Register of Historic Places.

Recommendations concerning the avoidance of these sites during bank stabilization construction activities have already been made by the principal investigator by telephone to personnel of the Planning Division of the Omaha District Office of the Corps of Engineers on 30 June and dates following. These recommendations are stated in the following paragraphs:

It is recommended that the Tick City site be afforded some protection from further river erosion through the selective placement of stabilization structures and, at the same time, that a specific part of the site area be avoided during construction activities involving any ground disturbance or movement of heavy equipment through the area. The specific area of construction avoidance should extend 91.4 m (300 ft) upstream and 91.4 m (300 ft) downstream from the original hearth findspot (Figure 4).

It is recommended that the Ivyland site be afforded some protection from further river erosion through selective placement of stabilization structures and, at the same time, that a specific part of the site area be avoided during construction activities involving ground disturbance or movement of heavy equipment through the area. The specific area of

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construction avoidance should extend from the original cultural debris findspot upstream to the mouth of Nettle Creek (a distance of ca. 100 m or 330 ft) and downstream from the findspot for a distance of 30.5 m (100 ft) (Figure 5).

Should any archeological remains be encountered during construction activities in any bank stabilization area, construction should halt immediately and a qualified professional archeologist from the University of North Dakota or the State Historical Society of North Dakota should be contacted immediately for consultation and onsite examination.

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Appendix A

Project Scope of Work

SCOPE OF WORK

The scope of work of this project shall consist of comprehensive testing of the Sandstone Bluffs II (32ML404) and Painted Woods (32ML406) Sites in McLean County, North Dakota. Testing shall include the digging of limited test pits and the prolific use of small diameter soil augers, sufficient to establish the general site configuration and potential National Register quality.

The testing results shall be compiled into a draft report. This report shall include, but not necessarily be limited to: (1) Abstract, (2) Introduction, (3) Regional locations, (4) Methodology, (5) Evaluation (discussion of previous work and inventory of cultural resources in the study area) see inclosed report by Dr. Zimmerman, (6) Mitigation required, (7) A concise definitive summary with references, and (8) Appendices as necessary. The introduction shall include, but not necessarily be limited to, a statement of purpose, delineation of site boundary, and a general statement of the testing procedures and review performance. The regional setting of the project should include a discussion of environmental factors affecting cultural resource locations. The draft report shall contain a summary and evaluation of previous archeological and historical studies in the area, including the dates, extent, and adequacy of past work as it reflects on the interpretation of what might be found in the project area during subsequent field investigations. The draft report shall contain an inventory of all known cultural resources in the study area. All references cited and/or utilized shall be listed in standard American Anthropological Association format. The draft report shall state whether the site(s) are eligible for inclusion on the National Register of Historic Places.

II. WORK SCHEDULE

The contractor shall submit six (6) copies of the completed investigation report, in draft form, by 30 June 1978. The Government shall have a maximum of 10 calendar days to review the draft report. The contractor shall have 10 calendar days to include the Government's review comments into the draft report and submit a final report.

III. METHOD OF PAYMENT

Payment for services rendered will be made upon receipt by the Government of the complete report in draft form for 75 percent of the contract price. The remaining 25 percent will be paid upon final acceptance by the Government.

IV. DISTRIBUTION OF DATA

Neither the contractor nor the contractor's representative shall release or publish any sketch, photograph, map, report, or any part thereof, or other material of any nature obtained or prepared under this contract without the specific written approval of the Contracting Officer.

Appendix B

Project Proposal Submitted by the
University of North Dakota

A Proposal for
Testing and Evaluation of Archeological Sites 32ML404 and 32ML406 in
McLean County, North Dakota

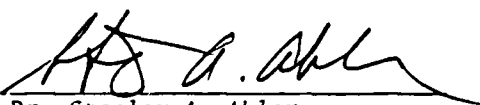
submitted by the
University of North Dakota
Grand Forks

to the
Omaha District
United States Army Corps of Engineers

Proposed period of investigation: June 1, 1978 through August 7, 1978.

Proposed amount: \$3,369.00

Endorsements:



Dr. Stanley A. Ahler
Research Archeologist
Project Principal Investigator



Dr. Earl J. Freise, Director
Office of Research and Program
Development

A Proposal for Testing and Evaluation of Archeological
Sites 32ML404 and 32ML406 in McLean County, North Dakota

A proposal is offered by the University of North Dakota which is responsive to a scope of work dated 10 April from the Omaha District of the U.S. Army Corps of Engineers calling for test excavation and evaluation of the potential National Register quality of two archeological sites, 32ML404 and 32ML406, on the left bank of the Missouri River in McLean County, North Dakota. The two sites are in an area to be affected by future bank stabilization projects contracted by the U.S. Army Corps of Engineers (Zimmerman et al. 1977). The purpose of the work will be to determine the general extent and content of each site in enough detail to provide meaningful recommendations to the Corps of Engineers regarding their potential National Register significance and any mitigative actions that may be appropriate. The project shall consist of two major parts: (1) field investigations and (2) laboratory analysis and report preparation.

Field Investigations

Each site was represented at the time of discovery by a lens of charcoal bearing debris exposed in the eroding cutbank of the Missouri River, at depths varying from ca. 0.70 to 1.0 m below the present ground surface. In each case, the linear extent of the site along the cutbank and the extent of the site back from the cutbank were undetermined. The object of the fieldwork, then, will be first, to determine the physical limits or extent of the cultural deposits, and second, to determine the cultural content, density, and significance of the cultural remains.

Survey with a proton magnetometer is a non-destructive procedure which is well suited to the discovery of subsurface cultural features

buried at depths of two m or less. Magnetic survey procedures are most useful for detecting buried iron or other magnetically susceptible materials such as bricks or burned earth, but it can successfully be used to detect subtle features such as trash filled pits and the edges of house depressions (cf. Weymouth and Nickel 1977 and Weymouth 1976 for application in the Middle Missouri subarea, and Aitken 1974 and Tite 1972 for discussions of theory). An additional advantage of magnetic survey is that it allows a relatively rapid coverage of large tracts of land providing more detailed information on the distribution and configuration of subsurface cultural features than would otherwise be obtainable in the same amount of time using procedures of soil coring and hand excavation. In summary, a survey by proton magnetometer seems particularly appropriate to the problem at hand. The availability of the equipment and trained personnel to operate it in the general project area this summer have led to the proposal that such procedures form the initial step in site evaluation at both archeological sites under examination.

Three 20 m square magnetic survey blocks, arranged parallel to and adjoining the river bank edge directly over the exposed cultural materials (forming a survey area measuring 20 m by 60 m in length) will be surveyed magnetically in either one m or two m (depending on conditions) data collection intervals using two proton magnetometers having sensitivities of one gamma. Differences between the base magnetometer and the moving magnetometer values will be plotted or graphed by hand along grid lines to produce magnetic profiles which can be used to detect subsurface magnetic anomalies and identify possible cultural features.

Following magnetic surveying, magnetic anomalies will be investigated by a combination of one inch diameter soil coring and hand excavations. All major magnetic anomalies will be first examined through the use of soil coring to confirm the presence of cultural materials and to make a preliminary classification of cultural features present. Then, limited test excavations will be conducted to verify the existence and interpretation of buried cultural features, and to collect sufficient cultural material to provide a cultural-historical and functional evaluation of the sites. It is anticipated that approximately four hand excavated test units will be needed at each site: one centered directly over the most dense or potentially productive area of known cultural material exposed in the river bank, and three additional units to explore cultural features on the upstream, downstream and landward parts of the magnetic survey area.

In the event that the magnetic survey results are largely negative and fail to detect cultural features beyond those exposed in the cutbank, systematic soil coring will be used along transects radiating from the exposed cultural deposit in an attempt to define the limits of the site. Approximately four hand excavated test units would still be placed in the site to determine the presence or absence of cultural materials, with one unit being placed over the known river bank deposits, and with the location of the remainder determined by the results of the soil coring investigations.

In the hand excavated test units, the sterile sediments overlying the cultural zone will be removed without screening, and recovery techniques appropriate to the situation will be consistently applied to any

excavated artifact-bearing sediments.

Laboratory Analysis and Report Preparation

Laboratory analysis will concentrate on washing, sorting, labelling, and classifying the cultural materials recovered from each site. Analysis will be sufficiently detailed to attempt to establish the cultural-historical placement of the sites in question and to properly prepare the collected materials for storage and curation, but would not be considered exhaustive in scope or intensity.

Following laboratory analysis, a draft report will be prepared according to the format and content specified by the Corps of Engineers in the scope of work for the project. It will contain the following sections: Abstract, Introduction, Regional Setting, Methodology, Evaluation (including evaluation of National Register eligibility), Mitigation Recommendations, Summary, References Cited, and Appendices as necessary. Again, the content of each section will be determined, but not limited by, the requirements in the scope of work. The project report will be prepared first in draft form, to be reviewed by the Corps, and then in final form including revisions according to the Corps' review comments.

Personnel and Work Schedule

A large-scale archeological research program will be conducted under the direction of the principal investigator in the Knife River Indian Villages National Historic Site (KNRI) at Stanton, North Dakota, during the months of June and July, 1978. The project proposed here would be conducted in conjunction with the work at Stanton, using field assistants, magnetic survey personnel, and proton magnetometer equipment already com-

mitted to the KNRI project. To avoid a conflict in work commitments, the proposed test excavation program would be conducted as a weekend or after-hours project.

All phases of the proposed research will be conducted under the direct supervision of the principal investigator, Stanley A. Ahler. A graduate student with advanced field experience will be designated by Ahler as the Project Supervisor, and that person will oversee field and laboratory work and will prepare the majority of the project report under Ahler's supervision. In addition, two persons with previous field and laboratory experience will be required as field assistants/laboratory assistants. Also, two persons with previous magnetometer training and experience will be in charge of conducting and interpreting the magnetic survey phase of the fieldwork, on a per day consulting basis.

Approximately one day of field time will be required of the project supervisor and two field assistants to clear the site surfaces of low, obstructing vegetation and to establish the site grid over the areas to be magnetically surveyed. The magnetic survey will require one day of effort at each site, involving the project supervisor, the two magnetic surveyors, and the two field assistants. The magnetic surveyors will work an additional day preparing the survey data results and constructing magnetic profile maps to be used to guide the coring and test excavation phases of fieldwork. Completion of fieldwork (coring and test excavation) will require about two and one-half days effort at each site involving the project supervisor and the two field assistants.

Laboratory analysis will take approximately two days effort from two laboratory assistants. Preparation of the draft report and revision and

preparation of the final report will require approximately seven days effort from the project supervisor. A clerk/typist will be required for an estimated five days time for data tabulation and typing of the draft and final versions of the project report.

The proposed beginning date for the project is June 1, 1978. The proposed due date for the draft version of the project report is August 7, 1978. The Government will be allowed 10 calendar days to review the draft report, and the University will have 10 additional calendar days to revise the draft report and submit the final project report.

Method of Payment

The method of payment will be that specified in the scope of work, with 75 percent of the contract price to be paid by the Government upon receipt of the draft report, and with the remaining 25 percent of the contract price to be paid upon acceptance of the final report by the Government.

Distribution of Data

The University reserves the right to use any data, sketch, photograph, map, report, or any part thereof, or other material of any nature obtained or prepared under this contract for inclusion in or as part of any thesis, dissertation, or other scholarly report or publication; at the same time, the University will exercise utmost caution in the distribution of such data and information to insure that such distribution does not in any way knowingly lead to the degradation or destruction of any known cultural resources.

References Cited

- Aitken, M.J.
 1974 Physics and Archaeology. Second edition, Oxford:Clarendon Press.
- Tite, M.S.
 1972 Methods of Physical Examination in Archaeology. New York: Seminar Press.
- Weymouth, J.W.
 1976 A Magnetic Survey of the Walth Bay Site (39WW203). Midwest Archeological Center, Lincoln, Nebraska.
- Weymouth, J.W. and R.K. Nickel
 1977 A Magnetometer survey of the Knife River Indian Villages. Plains Anthropologist, Memoir 13. 22(78):104-118.
- Zimmerman, L.J., J. Buechler, and S. Symes
 1977 A cultural resource reconnaissance of eight proposed bank stabilization sites in central North Dakota. Contract Completion Studies. Archaeology Laboratory, University of South Dakota.

Estimated Itemized Project Budget

An estimated budget for the proposed project is found on the following page. All salary and wage figures are those normally paid to each person in the specified positions. Indirect costs are computed exclusively at the negotiated off-campus rate of 32.0%, since all phases of the project will be conducted in the field situation.

ESTIMATED ITEMIZED PROJECT BUDGET

Salaries and Wages

Fieldwork:

Principal Investigator (S.A. Ahler) (2 days @ \$85.00)....	\$ 170.00
Project Supervisor (8 days @ \$50.00).....	400.00
Field Assistants (2 persons for 8 days each @ \$30.00)....	480.00

Laboratory Analysis and Report Preparation:

Principal Investigator (S.A. Ahler) (1 day @ \$85.00).....	85.00
Project Supervisor (7 days @ \$50.00).....	350.00
Lab Assistants (2 persons for 2 days @ \$30.00).....	120.00
Clerk/Typist (1 person for 5 days @ \$30.00).....	150.00

Subtotal of Salaries and Wages: \$1755.00

<u>Fringe Benefits</u> @ 15.0% of S and W.....	263.00
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<u>Indirect Costs</u> Off-campus rate of 32.0% of S, W, and Fringe..	646.00
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Consultation

Magnetic Survey Crew (2 persons for 3 days @ \$40.00).....	240.00
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<u>Vehicle Mileage</u> (500 miles @ \$0.17).....	85.00
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<u>Per Diem</u> (40 person days @ \$7.00).....	280.00
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<u>Miscellaneous Supplies</u>	50.00
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<u>Report Preparation and Copy Costs</u>	50.00
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Total Estimated Project Cost

\$3,369.00

